Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C.

In the Matter of	)	
	)	
Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services	)	CC Docket No. 92-297
	)	
and	)	
	)	
Suite 12 Group Petition for Pioneer's Preference	)	PP-22

REPLY COMMENTS OF ORION NETWORK SYSTEMS, INC.

ORION NETWORK SYSTEMS, INC.
2440 Research Boulevard, Suite 400
Rockville, Maryland 20850

VERNER, LIIPFERT, BERNHARD,
McPHERSON and HAND, CHARTERED
901 15th Street, N.W. Suite 700
Washington, D.C. 20005
(202) 371-6060

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SUMMARY

Orion submits its reply comments in this proceeding following its submission of applications and amendments seeking authority to utilize frequencies in the Ka-band for both domestic and international communications satellites. Orion focuses primarily upon spectrum issues related to the proposed segmentation of the Ka-band with potential impact on the geostationary, fixed satellite service ("GSO/FSS").

Orion agrees with the commenting parties who clearly have established the critical importance of Ka-band spectrum to the future of the growing, job-creating, U.S.-based satellite industry, and who have opposed the use of auctions for the assignment of that spectrum to satellite users as both contrary to the governing statute and contrary to the public interest. The 28 GHz band is the only feasible future home for expansion and growth of vital, innovative, cutting-edge communications services provided by both in the U.S. and in international markets.

The implications of the proposed band-segmentation plan transcend the domestic context. As Orion and other U.S. satellite companies face competition in a global marketplace, Orion remains concerned that U.S. satellite companies not be disadvantaged vis-a-vis their foreign competitors in terms of access to spectrum. Accordingly, Orion urges the Commission not to adopt a spectrum allocation in the Ka-band that may later prove inadequate to meet the global needs of U.S. satellite companies, if the international community does not agree with U.S. proposals at the 1995 World Radiocommunications Conference.

Orion continues to believe that 1,000 MHz of spectrum can support multiple GSO/FSS service on a primary or exclusive basis in the Ka-band. However, based on the sheer number of GSO/FSS proposals contained in the applications filed in response to the Ka-band Cut-Off Notice and the apparent limitations of the proposed band-segmentation plan, it is quite conceivable that little spectrum may remain available for future satellite system expansion in the Ka-band under the proposed band-segmentation plan. Moreover, while the Commission has proposed an additional 500 MHz for sharing between non-geostationary satellites ("NGSO/FSS") and GSO/FSS in the 28.6 to 29.1 GHz frequency range, with GSO/FSS operating with secondary status, in the absence of adequate and effective sharing criteria, harmful interference will likely result when a non-GSO satellite passes between a GSO/FSS satellite and an earth station.

Even more troubling is the potentially illusory allocation of 250 MHz of spectrum from 29.25 to 29.5 GHz on a co-primary basis with MSS feeder links. As the FCC has proposed a first-come-first-served policy regarding sharing of this band, and MSS systems likely will be deployed before GSO/FSS systems, appropriate rules and sharing criteria must be adopted in advance to ensure that GSO/FSS systems may share this band segment with MSS feeder links.

Finally, as the record in this proceeding fails to support CellularVision's contention that LMDS and GSO/FSS systems can share the same spectrum, Orion urges the Commission to impose strict conditions on the renewals of CellularVision's licenses requiring CellularVision to vacate the frequencies proposed for GSO/FSS use in the event that they are so allocated, especially in the event

that the Commission grandfathers CellularVision's use of 150 MHz, from 28.35 to 28.5 GHz on a temporary basis.

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REPLY COMMENTS OF ORION NETWORK SYSTEMS, INC.

On September 7, 1995, Orion Network Systems, Inc. ("Orion") submitted comments in response to the Third Notice of Proposed Rulemaking and Supplemental Tentative Decision ("Third Notice") in the above-captioned proceeding. Orion's comments indicated its intent to file GSO/FSS applications in response to the Commission's Cut-Off Notice for satellite applications specifying frequencies in the Ka-band.[1/] Accordingly, on September 29, 1995, Orion filed applications for authority to construct, launch, and operate two domestic communications satellites and one international communications satellite, all specifying Ka-band frequencies. In addition, Orion amended two of its pending applications,[2/] and applied to modify its conditional authority to construct an international communica-

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[1/] Public Notice released July 28, 1995, Report No. SPB-20.

[2/] File Nos. CSS-94-009 and 74-SAT-P/LA-95.

tions satellite to include frequencies in the Ka-band.[3/]

Orion has reviewed the comments of other parties in this proceeding, and hereby submits these reply comments with emphasis on issues related to the proposed segmentation of the Ka-band and its potential impact on the geostationary, fixed satellite service ("GSO/FSS"). As a general matter, Orion agrees with the commenting parties who clearly have established the critical importance of Ka-band spectrum to the future of the growing, job-creating, U.S.-based satellite industry, and who have opposed the use of auctions for the assignment of that spectrum to satellite users as both contrary to the governing statute and contrary to the public interest.[4/] Moreover, Orion agrees with the Satellite Industry Association (SIA), that the 28 GHz band is the only feasible future home for expansion and growth of vital, innovative, cutting-edge communications services provided by both in the U.S. and in international markets.[5/]

For these reasons, the proposed band-segmentation plan has implications that transcend the domestic context. As Orion and other U.S. satellite companies face competition in a global marketplace, Orion remains concerned that U.S. satellite companies not be disadvantaged vis-a-vis their foreign competitors in terms of access to essential spectrum. As the international community may not agree with U.S. proposals at the 1995 World Radiocommunications Conference (WRC-95), the Commission should not prematurely adopt a domestic spectrum

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[3/] File No. CSS-83-002-P.

[4/] See e.g., Comments of: Orion at pp. 3-5; SIA at pp. 5-18; GE Americom at pp. 22-26; PanAmSat at pp. 5-10; Loral at pp. 5-7; Lockheed-Martin at pp. 3-10.

[5/] SIA Comments at pp. 3-5.

allocation plan for the Ka-band that may later prove inadequate to meet the global needs of U.S. satellite companies.

I. THE COMMENTS SUPPORT ORION'S REQUEST FOR AN ALLOCATION OF AT LEAST 1,000 MHz FOR GSO/FSS

Orion indicated in its comments that at least 1,000 MHz of 28 GHz frequencies is necessary to support multiple Ka-band GSO/FSS systems.[6/] Several commenting parties have questioned the adequacy of the aggregate amount of spectrum proposed for allocation to geostationary fixed satellite services (GSO/FSS). Loral has indicated that 1,000 MHz is an insufficient aggregate allocation for the GSO/FSS service it has proposed in its pending application. Accordingly, Loral has requested that the primary GSO/FSS allocation be increased by 250 MHz to an aggregate allocation of 1,250 MHz of contiguous, unshared spectrum for GSO/FSS.[7/] Loral also views the non-contiguous nature of the spectrum proposed for GSO/FSS systems as problematic because it would result in higher design and construction costs and lower performance.[8/] While Orion takes no position on Loral's specific system requirements, Orion agrees that additional spectrum likely will be needed for GSO/FSS use in the future, and that higher costs for satellite design and construction will likely a result from the non-contiguous

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[6/] See Comments of GE Americom at pp. 2, 5-6; Comments of Hughes at pp. 5-7, and 7-11.

[7/] PanAmSat has recommended that the entire 28 GHz band be allocated to satellite services, noting that the services proposed by proponents of a local multipoint distribution service (LMDS) are redundant. See Comments of PanAmSat Corporation at pp. 2-3, 10.

[8/] Comments of Loral at p. 3.

nature of the proposed GSO/FSS spectrum allocation. If Orion's foreign competitors do not face similar constraints, this will place Orion and other U.S. satellite companies at a competitive disadvantage.

As the Commission struggles to decide the relative allocation of spectrum between the various satellite services and LMDS, the Commission should remain cognizant of the important and unique role of satellite communications services. Satellites provide essential global connectivity and ubiquitous service, while spectrum-intensive LMDS merely proposes in potentially lucrative urban areas to duplicate many of the video and telephone services or proposals of other technologies including the broadcast system, wireless cable systems, cable television systems, PCS, cellular, and wireline telephone systems. If the basis for allocating spectrum to LMDS has been the desirability of additional competition in the provision of these services, this spectrum allocation should be revisited especially if the pending telecommunications bills become law.[9/] In any event, the fact remains that the redundant services that LMDS proposes to provide are not possible without satellite service for cost-efficient national program distribution and international telecommunications. Therefore, the future of a robust U.S. satellite industry, an essential and unique component of our domestic and international telecommunications infrastructure, should not be jeopardized merely to provide spectrum for LMDS. In this regard, Orion requests that, if the Commission decides to respond favorably to the proposal of the Public Broadcasting System (PBS) for a

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[9/] See "Telecommunications Competition and Deregulation Act of 1995", S. 652; and "Communications Act of 1995", H.R. 1555; both of which promise to inject substantial new competition in the markets for cable television service, local telephone service, and interexchange telephone services.

non-commercial LMDS set-aside, the spectrum necessary to satisfy this request be taken from within the total spectrum to be allocated for LMDS, not from the spectrum proposed for satellite services.

Orion continues to believe that a minimum of 1,000 MHz of spectrum can support multiple GSO/FSS service on a primary or exclusive basis in the Ka-band. However, based on the sheer number of GSO/FSS proposals contained in the applications filed in response to the Ka-band Cut-Off Notice and the apparent limitations of the proposed band-segmentation plan, it is quite conceivable that little spectrum may remain available for future satellite system expansion in the Ka-band under the proposed band-segmentation plan. The Commission has proposed an additional 500 MHz for sharing between non-geostationary satellites ("NGSO/FSS") and GSO/FSS in the 28.6 to 29.1 GHz frequency range, with GSO/FSS operating with secondary status. However, in the absence of adequate and effective sharing criteria, harmful interference will likely result when a non-GSO satellite passes between a GSO/FSS satellite and an earth station. As one commenting party observed, when a NGSO satellite is located in the path between a GSO/FSS earth station and the GSO/FSS satellite, the GSO fixed earth station's transmissions may receive interference from MSS or a NGSO satellite transmissions to an MSS or NGSO/FSS earth stations.[10/] In essence, this secondary 500 MHz GSO/FSS allocation is illusory, unless the FCC requires the NGSO systems to coordinate with GSO/FSS systems to minimize interference, and to design a sharing plan that makes GSO use of this band feasible.

[10/] See Comments of GE Americom at pp. 9, 15-17.

II. THE COMMENTS DEMONSTRATE THE NEED FOR APPROPRIATE RULES AND SHARING CRITERIA TO PREVENT INTERFERENCE TO GSO/FSS OPERATIONS IN FREQUENCIES TO BE SHARED WITH OTHER SERVICES

Taken at face value, the proposed Ka-band segmentation plan appears to provide 1,000 MHz to GSO/FSS with primary status. However, just as the secondary 500 MHz is illusory, the comments filed in this proceeding reveal potential infirmities in this primary GSO/FSS allocation.[11/] These infirmities threaten to limit or restrict the effective spectrum resources available to GSO/FSS systems to perhaps as little as 850 MHz on a primary basis depending on the geographic area. In essence, the FCC has proposed a first-come-first-served policy regarding sharing between MSS feeder links and GSO/FSS in the frequency range from 29.25 to 29.5 GHz. In practical terms, the MSS service has a substantial head start over GSO/FSS proposals in the Ka-band. MSS licensees will, in all likelihood, deploy systems long before any GSO/FSS systems begin operations.[12/] In the absence of effective interference prevention criteria, this plan is destined to reduce the amount of spectrum available for GSO/FSS systems in a highly inefficient manner.

The FCC has not proposed any standards to ensure sharing between MSS feeder links and GSO/FSS systems in this band. Rules for spectrum sharing and interference coordination are necessary to level the playing field, given MSS's head start. Otherwise, MSS systems will be deployed without regard to cost-

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[11/] See Comments of Hughes at pp. 11-26; and Comments of GE Americom at pp. 13-15.

[12/] Comments of GE Americom at 9.

effective design considerations which may be incorporated in advance, and that may enhance the opportunities for shared use of the spectrum by MSS feeder links and GSO/FSS systems.[13/] In the absence of explicit requirements for coordination and effective sharing criteria in advance of the deployment of MSS space stations, MSS systems will have no incentive to ensure that GSO/FSS systems can share this spectrum.[14/] In light of the complexity of determining the optimal sharing approach, Orion agrees with the many parties to this proceeding who request that final resolution of the band-segmentation plan await the resolution of issues at WRC-95.[15/]

Numerical limits on the deployment of MSS feeder links, similar to those set for the band segment proposed for MSS and LMDS sharing, are necessary to ensure the viability of MSS and GSO/FSS sharing of this band. There should not be an unlimited number of MSS feeder links initially permitted, as this would result in an incentive for the over-construction of feeder links, before actual MSS system traffic requires their use, to warehouse capacity for the future. In addition, Orion agrees with Hughes that there should be a limit on the number of MSS systems that may share the band.[16/] The current proposal would permit additional MSS systems to enter the band, rather than just to accommodate the systems that now seek spectrum in the 28 GHz band pursuant to the Cut-Off

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[13/] See Comments of GE Americom at p. 16.

[14/] See Comments of Hughes at p. 12.

[15/] See e.g., Comments of TRW at pp. 33-37; Comments of GE Americom at 20; Comments of Air Touch at p. 2.

[16/] Comments of Hughes at p. 16.

Notice. Hughes suggests that the Ka-band be limited to two MSS systems, with limits on the number of feeder link earth stations, and requirements that MSS systems share spectrum with each other as much as possible.[17/] Orion disagrees; MSS feeder links should be accommodated in Ka-Band frequencies only to the extent the MSS feeder link operations can be engineered to be compatible with GSO/FSS systems. Only under these conditions, should an MSS system be permitted to operate in the 28 GHz band on a co-primary basis with GSO/FSS.

TRW asserted that interference mitigation techniques will make sharing between GSO/FSS and MSS feeder links feasible.[18/] Hughes and GE Americom have expressed some optimism about the potential deployment of diverse MSS feeder link facilities as a means to prevent some interference problems associated with the MSS space station intersecting the path between a GSO/FSS space station and earth station.[19/] However, Orion questions whether these techniques will remain feasible in the long-run, given the complexity created by sequential deployment of multiple GSO/FSS systems. There is likely a point of diminishing returns under these approaches; while they may facilitate sharing between the first, second, and possibly even a third GSO/FSS system and MSS

[17/] Comments of Hughes at p. 19.

[18/] The interference mitigation techniques suggested by TRW include: (1) phasing the MSS constellation to avoid the intersections of MSS and GSO/FSS space stations with MSS earth station transmissions hitting the GSO/FSS space stations; (2) reduced power to MSS feeder link earth stations when the intersections occurs; and (3) MSS feeder link traffic shifting to avoid the interference collisions. Comments of TRW at p. 25.

[19/] See Comments of GE Americom at note 2; Comments of Hughes at pp. 24-26.

feeder links, inevitably these techniques alone will not support the entry all the proposed Ka-band GSO/FSS systems.

Orion encourages the Commission to require MSS licensees to modify their feeder link system designs as required in advance of space station deployment to ensure that all GSO/FSS systems can be accommodated in the spectrum proposed for co-primary use. In addition Orion requests that the Commission require MSS licensees to explore the viability of reverse band-working solutions. If these approaches are not required of MSS licensees, sharing criteria will not be established in advance of the co-primary allocation and the result will be extremely wasteful of spectrum resources. As Hughes demonstrated in its comments, huge geographic exclusion zones could result from an uncoordinated deployment of MSS feeder links in this segment of the band. For example, a single MSS feeder link earth station located in Arizona could preclude GSO/FSS use of the same frequencies in virtually all of the states west of the Mississippi. Another MSS system, if the feeder links were located in Los Angeles and New York, could create similar large geographical exclusion areas for GSO/FSS uplink operation.[20/] When appropriate technical sharing solutions are identified by the parties -- including all Ka-Band GSO/FSS applicants, the FCC should adopt operational rules for Ka-band that reflect these solutions. If such solutions cannot be found, then the Commission should abandon the co-primary sharing proposal in the band segmentation plan to

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[20/] See Comments of Hughes at pp. 12-16.

afford GSO/FSS systems a full 1,000 MHz on an exclusive basis.[21/]

III. THE CONCERNS OF COMMENTING PARTIES OVER THE PROPOSAL TO PERMIT CELLULARVISION TO OPERATE TEMPORARILY IN 150 MHz OF GSO/FSS SPECTRUM SHOULD NOT BE IGNORED.

As a final matter related to the proposed band-segmentation plan, Orion wishes to echo the concerns of GE Americom and Hughes regarding the proposed temporary "grandfathering" of CellularVision in 150 MHz of spectrum from 28.35 to 28.5 GHz.[22/] CellularVision has proposed to expand its system by adding 33 new cells, using the same 1,000 MHz equipment installed at its initial cell in Brighton Beach. Hughes and GE Americom have requested that the Commission defer action on these applications until after the rulemaking is complete.

This temporary grandfathering proposal is particularly problematic in light of the Commission's parallel proposal to condition CellularVision's pioneer's preference on terms similar to those in PCS. Such conditions would require CellularVision to utilize its "original" technology to qualify for the pioneer's preference. As the "original" technology is said to require contiguous spectrum, it is conceivable that CellularVision would opt for the pioneer's preference and attempt

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[21/] In recognition of the importance of a full 1,000 MHz allocation for GSO/FSS, GE Americom has suggested that MSS feeder links be moved to the LMDS segment of the band, if sharing feasibility cannot be established. Comments of GE Americom at pp. 3-4, 13-15. Indeed, Motorola, CellularVision, and Texas Instruments were able to agree to a sharing plan for MSS feeder links and LMDS in the negotiated rulemaking. Another possibility is encourage a sharing solution between Non-GSO/FSS (Teledesic) and MSS feeder links. Both services are Non-GSO and therefore face similar operational requirements and constraints.

[22/] See Comments of GE Americom at pp. 7, 12; Comments of Hughes at p. 30

to leverage its position as a service provider to existing subscribers to persuade the Commission to remove the time limit on its temporary use of this 150 MHz of spectrum. The record is clear, spectrum sharing between LMDS and GSO/FSS systems has not proved to be feasible. Therefore, at a minimum, in the event that the Commission decides temporarily to grandfather CellularVision's use of these frequencies, the renewals of CellularVision's fixed and experimental licenses should be appropriately conditioned to ensure that these frequencies are vacated in a timely fashion before GSO/FSS systems are deployed.

IV. CONCLUSION

For the foregoing reasons, Orion respectfully recommends that: (1) defer final action on the proposed band-segmentation plan until the final decisions of WRC-95 are known; (2) the Commission revise its band-segmentation proposal if necessary to ensure that at least 1,000 MHz of bandwidth is actually available for GSO/FSS systems; (3) the Commission adopt effective sharing criteria and rules

governing sharing for both proposed MSS feeder link and GSO/FSS sharing and NGSO/FSS and GSO/FSS sharing; and (4) abandon the proposal to assign Ka-band satellite licenses by means of competitive bidding.

Respectfully submitted,

ORION NETWORK SYSTEMS, INC.

By: _____
Thomas J. Keller
Julian L. Shepard

VERNER, LIIPFERT, BERNHARD,
McPHERSON and HAND, CHARTERED
901 15th Street, N.W. Suite 700
Washington, D.C. 20005
(202) 371-6060

Richard H. Shay, Esq.
V.P. Corporate and Regulatory Affairs
April McClain-Delaney, Esq.
Director of Regulatory Affairs
Orion Network Systems, Inc.
2440 Research Boulevard, Suite 400
Rockville, Maryland 20850

Dated: October 10, 1995

Its Attorneys